

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1.-39. (Canceled).

Claim 40. (Original) A graded core/shell semiconductor nanorod comprising:
at least a first segment comprising:
a core comprising a Group II-VI, Group III-V or a Group IV semiconductor, a
graded shell overlying the core,
wherein the graded shell comprises at least two monolayers,
wherein the at least two monolayers each independently comprise a Group II-VI,
Group III-V or a Group IV semiconductor.

Claim 41. (Original) The graded core/shell semiconductor nanorod of claim
40, wherein:
the graded shell has at least three monolayers, and
the monolayer closest to the core comprises a first semiconductor material, and
the outermost monolayer comprises a second semiconductor material, wherein
between the monolayer closest to the core and the outermost monolayer there exists a
concentration gradient of the first and second semiconductor material.

Claim 42. (Original) The graded core/shell semiconductor nanorod of claim
40, wherein: the number of monolayers is between two and eight.

Claim 43. (Currently Amended) The graded core/shell semiconductor
nanorod of claim 42, wherein: the number of ~~monolayer~~ monolayers is between 2 and 6.

Claim 44. (Original) The graded core/shell semiconductor nanorod of claim
40, wherein: there is a tail extending longitudinally from the core.

Claim 45. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:
the core comprises CdSe and the graded core/shell comprises CdS/ZnS.

Claim 46. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:
there is joined to the first segment a second segment comprising:
a core comprising a Group II-VI, Group III-V or a Group IV semiconductor,
a graded shell overlying the core,
wherein the graded shell comprises at least two monolayers,
wherein the at least two monolayers each independently comprise a Group II-VI,
Group III-V or a Group IV semiconductor.

Claim 47. (Original) The graded core/shell semiconductor nanorod of claim 46, wherein:
the second segment core comprises CdSe and the second segment graded shell monolayers comprise, in order, CdS/ZnS.

Claim 48. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:
the first and the second segments have different cross sectional areas.

Claim 49. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:
there is a third segment joined to the second segment.

Claim 50. (Original) The graded core/shell semiconductor nanorod of claim 49, wherein:
the first, second and third segments have different cross sectional areas.

51. (Canceled).

Claim 52. (Previously Presented) A nanorod barcode, comprising:
a first segment of a first material; and
a second segment of a second material joined longitudinally to said first segment;
wherein at least one of the first and second segments is configured to generate
emission in response to excitation energy, and wherein:
said first and second segments comprise a nanorod core, and
said first and second segment cores independently comprise either a
semiconductor material selected from the group consisting of Group II-VI, Group III-V and
Group IV semiconductors or a metal selected from the group consisting of transition metals,
oxides and nitrides thereof.

Claim 53. (Original) The nanorod barcode of claim 52, wherein:
said first and second segment cores independently comprise a semiconductor
material selected from the group consisting of Group II-VI, Group III-V and Group IV
semiconductors.

Claim 54. (Original) The nanorod barcode of claim 52, wherein:
said first segment core comprises a metal selected from the group consisting of
transition metals, oxides and nitrides thereof, and
said second segment comprises a semiconductor material selected from the group
consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 55. (Original) The nanorod barcode of claim 52, further comprising:
a third segment connected longitudinally to said first segment core, and
said third segment core comprising a semiconductor material selected from the
group consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 56. (Original) The nanorod barcode of claim 55, wherein:
said second and third segments have different cross sectional areas.

Claim 57. (Original) The nanorod barcode of claim 55, wherein:

said first segment core comprises Co, and said second and third segment cores comprise CdSe.

Claim 58. (Original) The nanorod barcode of claim 53, wherein:
said first and second segments have different cross sectional areas.

Claim 59. (Currently Amended) The nanorod barcode of claim 58, wherein:
at least one of said first and second segment cores ~~have~~ has a graded shell
overlying the core.

Claim 60. (Original) The nanorod barcode of claim 58, wherein:
both segment cores have a graded shell overlying said cores.

Claim 61. (Original) The nanorod barcode of claim 53, wherein:
there is a third segment joined longitudinally to said second segment, and
said third segment comprises a semiconductor material selected from the group
consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 62. (Currently Amended) The nanorod barcode of claim 61, wherein:
at least one of said first and second and third segment cores ~~have~~ has a graded
shell overlying the core.

Claim 63. (Original) The nanorod barcode of claim 62, wherein:
all segment cores have a graded shell overlying the cores.

Claim 64. (Original) The nanorod barcode of claim 55, wherein:
said first, second and third segments have different cross sectional areas.

Claim 65. (Previously Presented) A method of using a nanorod barcode to
identify an element, comprising:
labeling at least one identifiable element with at least one nanorod barcode as
claimed in claim 52.

Claim 66. (New) The graded core/shell semiconductor nanorod of claim 40,
wherein:

the core comprises CdSe and the graded core/shell comprises CdS/ZnS, and
wherein a concentration of ZnS in the graded core shell gradually increases from the core
outward.